

## Attachment 5

### VA Internet Protocol Voice Service (IPVS) Technical Description

#### Internet Protocol Voice Service

Internet Protocol Voice Service (IPVS) provides voice communications service and telephony features to agencies using VoIP over a managed IP network.

#### **Service Description**

The Contractor shall provide a network-based (hosted) and premises-based IPVS telephone service over the contractor-provided IP network.

#### **Technical Capabilities**

The IPVS service shall include unlimited on-net to on-net and on-net to CONUS off-net calling. The IPVS shall support off-net calling to CONUS, OCONUS, and Non-Domestic locations. The Contractor shall provide capabilities that enable IPVS users to establish and receive telephone calls between both on-net locations and the Public Switched Telephone Network (PSTN).

The Contractor shall provide a remote access capability that, once enabled, provides users with the ability to use any landline or cell phone to make or receive phone calls as if they were making or receiving calls with Voice over Internet Protocol (VoIP) phones.

The following capabilities are mandatory:

1. Real time transport of voice, facsimile, and TTY communications
2. Real time delivery of Automatic Number Identification (ANI) information (when provided from the originating party)
3. Interoperate with public network dial plans (e.g., North American Numbering Plan and ITU-E.164)
4. Interoperate with private network dial plans and support direct dialing
5. (Optional) Interoperate with non-commercial, VA-specific 700 numbers
6. Provide access to public directory and operator assistance services
7. Provide unique directory numbers for all on-net VA locations, including support for existing VA numbers.
8. Provide the capability to initiate automatic callback
9. Support 3-way calling

The Contractor shall provide gateways for interoperability between the contractor's IP-based network and the PSTN, or with VA UNIs. The specific gateway will depend upon the ordering agencies UNI requirements. The gateway types and functionality are described below:

1. Subscriber Gateway – The Contractor shall provide interoperability for non-IP telephone devices. The contractor shall provide non-proprietary telephony station UNIs including (a) analog station and (b) ISDN BRI station interfaces.
2. PSTN Gateway – The Contractor shall provide transparent access to and interwork with the domestic and non-domestic PSTNs.

The Contractor shall provide the capability to support station mobility. Station mobility enables IP subscribers to dynamically move IP phones within the VA's enterprise wide network and access IP services.

The Contractor's IPVS shall have the capability to traverse and successfully interoperate with VA firewalls and security layers. The Contractor shall verify with the VA that the VA firewall is compatible with the contractor's service.

The Contractor shall ensure that security practices and safeguards are provided to minimize susceptibility to security issues and prevent unauthorized access. This includes Session Initiated Protocol (SIP)-specific gateway security for SIP firewalls, where applicable. The Contractor shall ensure that security practices and policies are regularly updated and audited. The general areas of security to be addressed include:

1. Denial of service – The Contractor shall provide safeguards to prevent hackers, worms, or viruses from denying legitimate users from accessing IPVS.
2. Intrusion – The Contractor shall provide safeguards to mitigate attempts to illegitimately use the IPVS service.
3. Invasion of Privacy – The Contractor shall ensure that IPVS is private, meaning that unauthorized third parties cannot eavesdrop or intercept IPVS communication numbers, IP addresses or Universal Resource Locators (URLs).

The Contractor shall fully comply with emergency service requirements, including 911 and E911 services, and identify the location of originating stations and route them to the appropriate Public Safety Answering Point (PSAP).

The contractor's IPVS shall comply with the Federal Communications Commission (FCC) Local Number Portability (LNP) requirements.

### **Features:**

The following IPVS features are mandatory:

ID Number	Name of Feature	Description
1	Voice Mail Box	<p>The contractor shall offer voice mail capability that includes voice messaging transmission, reception, and storage 24x7 except for periodic scheduled maintenance. The contractor-provided voice mailbox shall meet the following minimum requirements:</p> <ol style="list-style-type: none"> <li>1. At least sixty minutes of storage time (or 30 messages)</li> <li>2. Ability to remotely access voice mail services</li> <li>3. Secure access to voice mail via a password or PIN</li> <li>4. Automatic notification when a message is received</li> <li>5. Minimum message length of two minutes</li> <li>6. Capability to record custom voice mail greetings</li> </ol> <p>This capability can be administered on a station basis according to VA's ordering needs.</p> <p>The contractor shall send an email with a WAVE (.wav) file attachment of each voicemail message received by users of this feature to the email address that the user designates.</p> <p>The contractor shall provide users the capability to add other notification devices / email addresses or to update email information and email preferences when receiving and forwarding messages through a secure user web portal.</p>
2	Auto Attendant	<p>Auto Attendant allows callers to be automatically transferred to an extension without the intervention of an operator. The contractor shall provide capabilities allowing callers to dial a single number for high volume call areas and to select from up to nine (9) options to be directed to various attendant positions, external phone numbers, mailboxes or to dial by name or extension at a minimum.</p>
3	Augmented 911/E911 Service	<p>The contractor shall appropriately populate a 911 Private Switch/Automatic Location Identification (PS/ALI) database with the VA's profile which shall include all the users' telephone numbers, station locations, building location, building address, building floor, and room number during service implementation. The contractor shall provide secure remote access to the VA via a client or a web browser to allow the VA to maintain the VA's</p>

ID Number	Name of Feature	Description
		profile on an ongoing basis (e.g., to account for moves, adds, deletions, or other changes). The contractor shall ensure these VA profile updates are reflected in the PS/ALI database.

The Contractor shall send an email with a WAVE (.wav) file attachment of each voicemail message received by users of this feature to the email address that the user designates.

The Contractor shall provide users the capability to add other notification devices / email addresses or to update email information and email preferences when receiving and forwarding messages through a secure user web portal.

2. Auto Attendant - Auto Attendant allows callers to be automatically transferred to an extension without the intervention of an operator. The Contractor shall provide capabilities allowing callers to dial a single number for high volume call areas and to select from up to nine (9) options to be directed to various attendant positions, external phone numbers, mailboxes or to dial by name or extension at a minimum.

3. Augmented 911/E911 Service - The Contractor shall appropriately populate a 911 Private Switch/Automatic Location Identification (PS/ALI) database with the VA's profile which shall include all the users' telephone numbers, station locations, building location, building address, building floor, and room number during service implementation. The contractor shall provide secure remote access to the VA via a client or a web browser to allow the VA to maintain the VA's profile on an ongoing basis (e.g., to account for moves, adds, deletions, or other changes). The contractor shall ensure these VA profile updates are reflected in the PS/ALI database.

4. Unified Mobility - Allows users to answer incoming calls on the desk phone or at a remote destination and to pick up in-progress calls on the desk phone or at a remote destination without losing the connection.

5. Session Initiation Protocol (SIP) Universal Resource Identifier SIP (URI) Dialing - This feature supports SIP URI as an additional type of remote destination for Unified Mobility. When the Directory Number (DN) is called, a Communications Manager extends the call to a SIP trunk that digit analysis selects with this SIP URI in the To: header.

This feature only allows routing that is based only on the domain name, not based on the full SIP URI.

When a remote destination of this type is configured, other Unified Mobility features, such as two-stage dialing, transformation to DN number when calling into a Unified

Communications Manager, Interactive Voice Response (IVR) support, caller ID match, or Dual Tone Multi Frequency (DTMF) transfer and conferencing, do not get supported.

7. Dual Tone Multi Frequency - In-band telecommunication signaling system using the voice-frequency band over telephone lines between telephone equipment and other communications devices and switching centers.
8. Active Directory Federated Services (ADFS) Single Sign on Integration(SSOI) - A software component developed by Microsoft, can run on Windows Server operating systems to provide users with single sign-on access to systems and applications located across organizational boundaries. It uses a claims-based access-control authorization model to maintain application security and to implement federated identity. Authentication involves authenticating a user based on a set of claims about that user's identity contained in a trusted token. Such a token is often issued and signed by an entity that is able to authenticate the user by other means, and that is trusted by the entity doing the claims-based authentication.
9. Soft Phone Support - No added costs for licensing and features when provided with a soft phone which matches the hard phone feature set. Direct reduction in per seat hardware cost when a soft phone is chosen instead.
10. Call Detail Record (CDR) - A call detail record (CDR) in voice over IP (VoIP) is a file containing information about recent system usage such as the identities of sources (points of origin), the identities of destinations (endpoints), the duration of each call, (ANI, DNIS). Managed Service Provider to comply with Federal NARA retention requirements and provide records to VA, upon request.

The following standard features shall be included in the IPVS services:

1. Caller ID
2. Conference Calling
3. Do Not Disturb
4. Call Forward – All
5. Call Park
6. Hotline
7. Call Forward – Busy
8. Call Pickup
9. Hunt Groups
10. Call Forward – Don't Answer
11. Class of Service Restriction

12. Multi-Line Appearance
13. Call Hold
14. Distinctive Ringing
15. Directory Assistance
16. Call Transfer
17. Call Waiting
18. Speed Dial
19. Call Number Suppression
20. Specific Call Rejection
21. Last Number Dialed
22. IP Telephony Manager (Administrator)
23. IP Telephony Manager (Subscriber)
24. Single number reach
25. Busy lamp field
26. Unified Mobility
27. Call Barge
28. Call History
29. Shared lines
30. Message Waiting Indicator
31. Missed Call Notification
32. Mute
33. Web Self Service Phone profile / voice mail access

### **Performance Metrics**

The performance levels and AQL of KPIs for IPVS are VA standards and are mandatory unless marked optional.

- $\leq 150$  ms of one-way latency from mouth to ear (per the ITU G.114 standard)

Key Performance Indicator (KPI)	Service Level	Performance Standard (Threshold)	Acceptable Quality Level (AQL)	How Measured
Latency	Routine	200 ms	≤ 200 ms	See Note 1
Grade of Service (Packet Loss)	Routine	0.4%	≤ 0.4%	See Note 2
Availability	Routine	99.6%	≥ 99.6%	See Note 3
	Critical	99.9%	≥ 99.9%	
Jitter	Routine	10 ms	≤ 10 ms	See Note 4
Voice Quality	Routine	Mean Opinion Score (MOS) of 4.0	MOS ≥ 4.0	See Note 5
Time to Restore	Without Dispatch	4 hours	≤ 4 hours	See Note 6
	With Dispatch	8 hours	≤ 8 hours	

Notes:

1. Latency is the average round trip time for a packet to travel from source SDP to destination SDP. This applies to CONUS.
2. Grade of Service (Packet Loss) is defined as the percentages of packets that are sent by the source SDP but never arrive at the destination SDP (the percentage of packets that are dropped).
3. Availability is measured end-to-end and calculated as a percentage of the total reporting interval time that the IPVS is operationally available to the agency. Availability is computed by the standard formula:

$$Availability = \frac{RI(HR) - COT(HR)}{RI(HR)} \times 100$$

4. Jitter is the average variation or difference in the delay between received packets of an IP packet data stream from SDP to SDP. Relevant standard: IETF RFC 1889. This applies to CONUS.
5. As defined in ITU-T specification P.800 series.